# SHUTTLE CRITICAL ITEMS LIST - ORBITER

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BSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2414B -2 REV:06/15/88

ASSEMBLY : AFT LCA-1,2,3

CRIT. FUNC: 1R CRIT. HDW:

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6-18- C. V. J. J.

P/N RI :JANTXVIN5551

103 104

P/N VENDOR: QUANTITY

VEHICLE 102 EFFECTIVITY: X X Х

SIX

PHASE(S): PL X LO X OO DO

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:
DES J BROWN

APPROVED BY: DES

OE

APPROVED BY (NASA): EPDC SSM LINEON.

1 Krmura 6/27/00

MPS SSM EPDC RECENT

REL CAF DEFENSOR REL

TW- D MASAI

9.0, Compen 6/27/20

MPS\_RELV~

ITEM: DIODE, BLOCKING (3 AMP), HELIUM ISOLATION VALVE B(LV2/4/6) CLOSE SWITCH SCAN DIODE.

#### FUNCTION:

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ISOLATES CONTROL BUSES AND CLOSE COMMANDS IN THE SWITCH SCAN CIRCUIT. 55V76A121J1(86), (88), 56V76A122J1(86), (88), 57V76A123J1(86), (88),

### FAILURE MODE:

HORT (END TO END).

## CAUSE(S):

STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

## EFFECT(S) ON:

- (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY
- (A) LOSS OF ISOLATION BETWEEN CONTROL BUSES. DEGRADATION OF REDUNDANCY AGAINST INADVERTENT CLOSURE OF HELIUM SUPPLY ISOLATION VALVE B.
- (B,C,D) NO EFFECT FIRST FAILURE.

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SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2414B -2 REV: 06/15/88

- (E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE. TIME FRAME - ENGINE OPERATION.
  - 1) DIODE SHORT (END TO END) .
  - 2) ASSOCIATED SWITCH CONTACT SHORTS TO GROUND RESULTING IN CLOSURE OF ISOLATION VALVE B (LV2/4/6).
  - HELIUM SUPPLY ISOLATION VALVE A (LV1/3/5) FAILS CLOSED.

FAILURES WILL RESULT IN LOSS OF HELIUM REQUIRED TO PERFORM CONTINUOUS PURGING OF HIGH PRESSURE OXIDIZER TURBOPUMP INTERMEDIATE SEAL CAVITY. THIS CAVITY IS BETWEEN TWO SEALS, ONE OF WHICH CONTAINS THE HOT, FUEL-RICH GAS IN OXIDIZER TURBINE AND THE OTHER CONTAINS THE LIQUID OXYGEN IN OXIDIZER TURBOPUMP. LEAKAGE THROUGH ONE OR BOTH SEALS COULD RESULT IN A CATASTROPHIC EXPLOSION IF ALLOWED TO ACCUMULATE. CONTINUOUS OVERBOARD PURGE OF THIS AREA PREVENTS THIS ACCUMULATION FROM OCCURRING. POSSIBLE LOSS OF CREW/VEHICLE.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

## DISPOSITION & RATIONALE:

- (A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE
- (A-D) FOR DISPOSITION AND RATIONALE:
  REFER TO APPENDIX F, ITEM NO. 4 DIODE, AXIAL LEAD.
- (B) GROUND TURNAROUND TEST

  COMPLETE ELECTRICAL VERIFICATION, V41AAO.015F,G; V41AAO.035F,G;
  V41AAO.055F,G EVERY FLIGHT.
- (E) OPERATIONAL USE NO CREW ACTION CAN BE TAKEN.